NORTHERN PLANT NOVELTIES FOR 1940

Department of Horticulture, South Dakota Experiment Station
Brookings, South Dakota, January 18, 1940

Total Nine Pages

This department does not conduct a commercial nursery, but propagates and distributes new varieties originated in this department or imported from similar climates of the Old World. Many acres of seedling fruits have been grown since the work was started in 1895. The improvement in size and quality of each plant generation is greater year by year. Hybridization and selection are the main methods of improvement. The work has been honored by four medals awarded to Dr. N. E. Hansen and by extensive propagation and planting of many of the new varieties. The medals are: The George Robert White gold medal of honor for "eminent service in horticulture" by the Massachusetts Horticultural Society, 1917; the Marshall P. Wilder silver medal by the American Pomological Society for new fruits, 1929; gold medal for public service by Cosmopolitan club, Sioux Falls, 1933; A. P. Stevenson gold medal for new fruits by the Manitoba Horticultural Society, 1935.

A host of new seedling fruits and roses is coming on, which will be sent out as soon as they are deemed to be up to standard.

Some of the material in this list is offered for distribution to plant-breeders to help in the work of improving hardy fruits and roses elsewhere.

Terms: The money received from the sale of plants makes it possible to do the work on a larger scale than would otherwise be possible. Those who have followed the progress of the work for many years know the importance of ordering promptly, as soon as this list is received, as the supply of plants is limited. Terms are cash with order. No credit except to the Government Experiment Stations. For South Dakota orders add three per cent to the above prices for State Retail Sales Tax.

Northern Novelties in Fruits and Roses

The following new introductions by Dr. N. E. Hansen, Emeritus Professor of Horticulture, are worthy additions to his long list of hardy fruits and roses, (Nine varieties are offered for the first time):

Pear Okolo, Sungari, Ilya.
Crabapple-Keo.
Apple-Nebo, Semla.
Bushcherry-Checkpa, Kasota.
Rose-Yawa.
NOTE: There are no propagation restrictions on any of these new varieties.

Fruits Already Introduced: Scions of new fruits listed in earlier lists will be supplied as far as available at 50 cents per foot.

Progress in Pears

It has been the endeavor for many years to hybridize the native pear of East Siberia and North China with standard cultivated pears. Several have already been named. It is gratifying to report splendid progress in 1939 with hybridizing pears. Several new seedlings bore a heavy crop of fruit, excellent in quality and of good commercial size. The trees are free from fire-blight. Some of them will be named for distribution next spring. This work amply demonstrates that the size and high quality of the standard pears of western Europe can be combined in large measure with hardiness and immunity to fire-blight of the pears of East Siberia and north China.

Okolo pear - Offered for the first time. Pedigree: a seedling of Pyrus Ovoidea (Simonii). Fruit $2\frac{1}{4}$ x $2\frac{1}{4}$ inches, obtuse pyriform. Clear light yellow, with multitude of minute dark russet dots. Stem long, stout. Flesh white, firm, juicy; flavor delicious. Tree a heavy bearer. (Okolo: the Russian for "round"). Only scions available, $1.00 per foot.

Sungari pear - Offered for the first time. Pedigree: the Russian "Vinnaja Selenaja" ("Green wine") pear x pollen of Pyrus Ovoidea (Simonii) pear of north China. Fruit 2 x $2\frac{1}{2}$ inches, oblong pyriform, with long stem. Clear yellow with faint russet dots. Flesh tender, pleasant, very juicy when fully ripe, excellent for table or cooking. A valuable fall pear. (Sungari: a river in northeast Manchuria.) Only scions available, $1.00 per foot.

Ilya pear - Offered for the first time. Pedigree: a Russian pear Vinnaja selenaja ("Green wine") x pollen of a standard pear from southern Missouri. Fruit $2\frac{1}{4}$ x $2\frac{1}{4}$ inches, globular, somewhat irregular and obscurely angular, especially around the stem; yellow with minute inconspicuous russet dots. The fruit of the Russian pear was a pleasant subacid, but with prominent grit cells. In this hybrid there is no increase in size but the flesh is tender, melting and free from grit, pleasant subacid. Very juicy when fully ripe. A good summer table and culinary pear. (Ilya: a legendary Russian giant.) Only scions available, per foot $1.00.

The following are one-year old root-grafts on seedlings of Saponsky pear (Pyrus Ussuriensis from East Siberia). Price: one-year-old root-grafts of any variety in the following list, each $1.00; scions per foot 50 cents. The root-grafts are available in the following numbers:

Finland	16	Sadko	21
Finsib	8	Selenga	14
Krylov	14	Sladky	15
Pyrus ovoidea (Simonii)	27	Tanya	33
Russian Sandpear	14	Valya	16
		Yermak	35

Finland Pear - Introduced 1933. An open-pollinated seedling of the Yellow Early Finland pear planted next to row of Russian sandpear. A yellow pear, two inches in diameter and of excellent quality. Stem extra long.

Finsib Pear - Introduced 1939. Pedigree: Finland Early Yellow x Saponsky pollen. The Finland Yellow Early pear was brought from Russia. The Saponsky is Pyrus Ussuriensis of East Siberia. The Finsib pear is 2 x 2 inches, globular, acute pyriform, yellow with minute russet dots. Stem long, up to $2\frac{1}{4}$ inches. Flesh juicy, melting; quality excellent.

Krylov Pear - Introduced 1933. A fine large early pear of good quality. Pedigree: Saponsky pear of eastern Siberia x Lincoln pear pollen.

Pyrus Ovoidea (Simonii) - Introduced 1922. Pedigree: the Chinese wild pear originally from the Arnold Arboretum, Boston. Described in S. D. Bulletin 224. Fruit is 1 5/8 inches in diameter.

Sadko Pear - Introduced 1933. Pedigree: Russian sandpear x Vermont pear pollen. A fine large red pear of good quality. Tree strong with good forks.

Selenga Pear - Introduced 1939. Pedigree: Saponsky (East Siberian Pyrus Ussuriensis) x White Doyenne pear pollen. Fruit oblong pyriform, 1 3/4 inches across, $2\frac{1}{2}$ inches deep, yellow with minute russet dots, quality excellent, season October. Tree productive.

Bigger and Better Siberian Crabapples

Out of thousands of hybrids of the Siberian crab, Pyrus baccata, with the standard tame apple, produced here and elsewhere, the limits of variation begin to appear. Whitney, Hyslop and Transcendent are some of the earlier crabs. As a class some are too large for a crab and too small for an apple.

In order to obtain larger size a multitude of back-crosses with the standard apple have been produced here and in other states and especially in Canada. The third back-cross at Ottawa gives full apple size. The present problem is: Can the hardiness of the Siberian crab be combined with the large size of the standard apple; or will the hardiness be intermediate?

Keo: A Large Red Siberian Crabapple

Offered for the first time. This Amur crabapple seedling fruited heavily this year, 1939. The tree was standing far from other apple trees, so it is very likely selfed. The fruit is 1 and 5/8 inches across, oblate, regular; with a flat basin; flesh white, sauce red-tinted, of excellent quality; the slices retain their shape in cooking. The color is really remarkable: an intense polished bright crimson red all over, shaded deeper on the sun side. The fruit would sell at sight in any market. The fresh fruit is a crisp, pleasant, juicy acid, just what is wanted in a crab; it also stands up well, which is a characteristic derived from the Amur crab which does not soften easily.

There is a large number of crabapples on the market, but since the market demand is so strong towards bright red color, this new seedling will attract attention. As with Dolgo, Amur, Beauty, Alexis, and the others of similar descent, it is a very heavy bearer. Scions, $1.00 per foot.

S. D. Bison Crabapple - The Bison Crab was introduced in 1933. The name was changed in 1939 to South Dakota Bison to distinguish it from a Canadian apple seedling. Fruit $1\frac{1}{2}$ inches across, red, and of excellent quality. Pedigree: Jonathan apple x Sylvia crab, making it one-half Jonathan apple, one-fourth Siberian crab, Pyrus baccata, and one-fourth Yellow Transparent apple. The tree is a very heavy bearer. Under orchard conditions this may turn out to be almost an apple in size. Available number, 43 one-year-old root-grafts on Siberian (Alexis) crabapple roots, each $1.00.

S. D. Bona Crabapple - Introduced 1938. Pedigree: Jonathan x Sylvia crab pollen. A sister to the S. D. Bison. Fruit $1\frac{1}{2}$ inches across, $1\frac{1}{4}$ inches deep, color an attractive deep rich solid polished red, nearly black red; flesh yellow, rich mild pleasant subacid, cooks easily with red sauce, of very good quality. Late fall or early winter. Tree a heavy bearer. Available number, 48 one-year-old root-grafts on Siberian crabapple (Alexis) roots, each $1.00.

S. D. Jonsib Crabapple - Introduced 1938. Pedigree: Jonathan apple x Irkutsk, Siberia, crab (Pyrus baccata) pollen. The highly colored fruit is 1 3/4 inches across; a mixed striped red over yellow ground. The mottled mixed red gives the shady side a rich orange-red effect. The sauce is light red and of excellent quality. The tree bore a heavy crop in 1938 and 1939. The highly attractive color, good size and excellent quality of the fruit gives it a claim upon recognition as a red crabapple for market. Scions only, per foot 50 cents.

Ham: A Dairy Farm Simulation Game

Ham is a game for one player. The player is the manager of a dairy farm. The farm has a herd of cows, a barn, a silo, and a field. The player must buy feed, milk the cows, and sell the milk and the cows' calves. The goal is to earn money by keeping the farm profitable.

The game runs in 16 turns, one for each month of a year. At the start of each turn, the program prints the farm's current state:

```
Month 3 of 16
Cash:      $1,200
Cows:      12
Silo:      800 kg
Hay:       1,500 kg
Grain:     300 kg
Milk:      0 kg
Calves:    2
Price/kg:  $0.40
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The player then chooses one action from a menu:

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1. Buy hay
2. Buy grain
3. Milk cows
4. Sell milk
5. Sell cows
6. Sell calves
7. Feed cows
8. Quit
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Milking produces milk in proportion to the number of cows and the amount of feed in the silo. Selling milk earns money at the current price per kilogram. Selling cows and calves earns a fixed price per animal. Feed costs money and is consumed from the silo. Hay and grain are purchased in bulk and arrive at the start of the next month.

The program ends after month 16 or when the player chooses Quit. The final score is the total cash plus the value of the remaining cows, calculated at the last price.

S. D. Eda Crabapple - Offered for the first time. Really a choice dessert apple. Pedigree: Jonathon x Tony crab pollen. This makes it ½ Jonathan; ¼ baccata; ¼ MacMahon White apple. A sister to S. D. Ben crabapple introduced in 1938. Fruit 2¼ inches across x 1 3/4 inches deep, oblate, regular, cylindrical, truncated. Color a deep solid polished and marbled red, thinly striped over yellow. Flesh a rich, pleasant subacid much like Jonathan. The fruit cooks like a Jonathan and is of excellent quality, the slices retaining their shape. The fruit is unusually heavy for its size. When propagated and given orchard conditions probably the fruit will be larger. Both of these two varieties are choice dessert apples for late fall and early winter. Scions only, per foot 50 cents.

S. D. Ben Crabapple - Introduced 1938. Evidently an annual bearer. Pedigree: Jonathan apple x Tony crab pollen. This makes it ½ Jonathan, ¼ baccata crab, ¼ MacMahon White apple. Fruit two inches across, nearly all covered with red, striped and mixed over yellow ground with white bloom. The yellow ground color is very light and clear. Basin is flat, minutely wrinkled. Flesh white very firm, juicy, a pleasant lively subacid; cooks tender into sauce of excellent quality. The sauce is yellow; the slices retain their shape but are tender. One apple judge said: "A flavor all its own." Not fully colored end of August, season evidently winter. Scions only, per foot 50 cents.

1917

Dolgo Crabapple - The original Dolgo was selected from a lot of one-year-old Pyrus baccata seedlings brought from Russia in 1897. The best one was named Dolgo (the Russian word for "long"), so named in recognition of the long conical, intensely bright red crabs about which many inquired at the annual exhibits of this Department at the South Dakota State Fair. This has become widely popular in many states, as far east as New York as appears from the following description in "A Catalog of New Fruits 1939-40" issued by the New York State Fruit Cooperative Association, Geneva, New York:

"Dolgo--is a handsome red crab apple imported from Russia in 1897 by Professor N. E. Hansen of the South Dakota Experiment Station. The fruit is full of juice, jellies easily, and makes a rich, ruby-red jelly of beautiful color and excellent flavor. The tree is hardy, vigorous, and productive; the season early September. Splendid for cider as well as jelly."

A few scions from the original Dolgo tree, 50 cents per foot.

Siberian and Manchurian Crabapple Stocks for Apples

Root-killing of standard apples on common apple stocks occurs frequently in the prairie Northwest. A variety may be hardy but if the root is tender, the tree is short lived. Experiments for many years (S. D. Bulletin 65, Root-killing of Apple Trees, N. E. Hansen, July, 1899) demonstrates that the Siberian crab does not root-kill and is a dependable hardy stock. Gradually through the years the use of Siberian crabapple for stocks is increasing. The trees make a strong smooth growth in nursery.

One chief difficulty is the extra expense. The ripe crabapples have a good market value and this makes the seed expensive. The large hybrid crabs often are poor seeders. The Virginia crab is an example; cytological research shows it to be a triploid with 51 chromosomes. The old Yellow Siberian crab yields good seed but is now very scarce owing to the advent of new varieties with larger fruit.

The pure Pyrus baccata often bears fruit less than one-half inch across and is hardy but too small to be of market value; the trees are planted for ornament and for bird-food. Orchards of such trees should be planted to furnish a steady supply of seed for stocks. Such fruit is too small to be sold for fruit. One of these forms of Pyrus baccata now coming into prominence in Minnesota is the Manchurian crab introduced 1926 (see S. D. Bulletin 224). The original fruit was gathered by Prof. N. E. Hansen in 1924 in the mountain region, about fifty miles east of Harbin, Manchuria. These trees are heavy croppers of small trees. The fruit is 3/8 to 1/2 inch across, about 1662 fruits to a pound. The seedlings are good for budding and make strong trees in nursery; they are now in commerce. The Manchurian crab is a form of the Siberian crab (Pyrus baccata var., Mandshurica, Maxim). The species Pyrus baccata is an omnibus species, including many forms varying from tall trees in the Lake Baikal region to much smaller trees farther east. Some trees of this species bear fruit freely at five feet in height.

Here in Brookings many Siberian crabs have been tested for stocks. Amur, Beauty, Dolgo, and Alexis all make good stocks. Of small fruited primitive forms of Pyrus baccata, the Irkutsk seedlings make good stocks.

Scions of Amur, Beauty, Alexis, and Manchurian crabapple, 4 feet for $1.00.

Apples: Triploid and Tetraploid

Hansen's Kola crabapple, introduced 1922, the first tetraploid (with 68 chromosomes, double the usual diploid number), continues to attract attention in several countries. There are many more in this lot of seedlings in which entirely new types of apples are appearing of great value for the open prairie; smaller in tree, but with good fruit that will keep a year; also heavy annual bearers. They offer a chance to originate many triploid apples (51 chromosomes). Recent cytological study in Sweden and England indicates triploid apples contain more vitamins than ordinary apples.

Scions of Kola crabapple, 2 feet for 50 cents.

S. D. <u>Ben Crabapple</u> - offered for the first time. Mainly [illegible] apple. Pedigree: Jonathan x Tony crab pollen. This makes it ½ Jonathan, [illegible] ¼ MacMahon White apple. A sister to S. D. Ben crabapple introduced [illegible] 2¼ inches across x 1 3/4 inches deep, obtuse, regular, cylindrical, [illegible] a deep solid polished and marbled red, thinly striped over yellow. [illegible] pleasant subacid much like Jonathan. The fruit cooks like a Jonathan [illegible] excellent quality, the slices retaining their shape. The fruit [illegible] its size. When propagated and given orchard conditions probably the fruit [illegible] larger. Both of these two varieties are choice dessert apples for [illegible] early winter. Scions only, per foot 50 cents.

S. D. <u>Ben Crabapple</u> - Introduced 1938. Evidently [illegible] Pedigree: Jonathan apple x Tony crab pollen. This makes it ½ [illegible] crab, ¼ MacMahon White apple. Fruit two inches across, nearly [illegible] striped and mixed over yellow ground with white dots. The [illegible] very light and clear. Basin is flat, minutely wrinkled. [illegible] juicy, a pleasant lively subacid; cooks tender into [illegible] sauce is yellow; the slices retain their shape but [illegible] "A flavor all its own." Not fully colored end of August, [illegible] Scions only, per foot 50 cents.

<u>Dolgo Crabapple</u> - The original Dolgo was selected from a lot of [illegible] Pyrus baccata seedlings brought from Russia in 1897. [illegible] (the Russian word for "long"), so named in recognition of the <u>long</u> [illegible] bright red crabs about which many inquired at the annual exhibit of [illegible] at the South Dakota State Fair. This has become widely popular in [illegible] far east as New York as appears from the following description in "A Catalog of New Fruits 1939-40" issued by the New York State Fruit Cooperative Association, Geneva, New York:

"Dolgo--is a handsome red crab apple imported from Russia in 1897 by Professor N. E. Hansen of the South Dakota Experiment Station. [illegible] jellies easily, and makes a rich, ruby-red jelly of beautiful color and [illegible] flavor. The tree is hardy, vigorous, and productive; the [illegible] Splendid for cider as well as jelly."

A few scions from the original Dolgo tree, 10 cents per foot.

<u>Siberian and Manchurian Crabapple Stocks for Apples</u>

Root-killing of standard apples on common apple stocks occurs frequently in the prairie Northwest. A variety may be hardy but if the root is tender, the tree is short lived. Experiments for many years (S. D. Bulletin 63, Root-killing of Apple Trees, N. E. Hansen, July, 1899) demonstrated that the Siberian crab [illegible] kill and is a dependable hardy stock. Gradually through the years the use of Siberian crabapple for stocks is increasing. The trees make a strong [illegible] nursery.

One chief difficulty is the extra expense. The [illegible] market value and this makes the seed expensive. The large hybrid crabs often are poor seeders. The Virginia crab is an example; cytological research shows it to be a triploid with 51 chromosomes. The old Yellow Siberian crab [illegible] now very scarce owing to the advent of new varieties with larger fruit.

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Here in Brookings many Siberian crabs have been tested [illegible] Amur, Beauty, Dolgo, and Alexis all make good stocks. Of small fruited primitive forms <u>Pyrus baccata</u>, the Irkutsk seedlings make good stocks.

Scions of Amur, Beauty, Alexis, and Manchurian crabapples, [illegible]

<u>Apples: Triploid and Tetraploid</u>

Hansen's Kola crabapple, introduced 1941, the first tetraploid [illegible] chromosomes, double the usual diploid number), continues to attract [illegible] several countries. There are many more in this lot of seedlings [illegible] new types of apples are appearing of great value for the open prairie; smaller trees, but with good fruit that will keep a year; also heavy annual bearers. [illegible] offer a chance to originate many triploid apples (51 chromosomes). [illegible] study in Sweden and England indicates triploid apples [illegible] ordinary apples.

Scions of Kola crabapple, 2 feet for 50 cents.

Three-fourths Apple; one-fourth Wild Crab

The backcross of the Ioensis x Malus hybrids to Malus give large size and good quality. In the language of the stockman, "the second top-cross" gives the size and quality.

Nebo apple - Offered for the first time. Pedigree: Alexander apple x Mercer wild crab pollen. Fruit 3¼ inches across, round, regular, truncated, slightly tapering; basin narrow, shallow, smooth; cavity obtuse. Color red, striped, grayed, mixed and splashed. Flesh pleasant subacid, juicy, cooks up easily into excellent sauce. The tree is productive. The largest so far of all these apple seedlings. (Nebo: the Russian for "sky").

The Alexander was introduced into England from Russia in 1817 and later from there to America, the year unknow. It is the Emperor Alexander, one of the largest of all apples, and classified as a member of the Aport group of Russian apples. The huge Wolf River from Wisconsin is no doubt a seedling of the Alexander. Scions only, per foot, 50 cents.

Wakpala apple - Introduced 1928. A good sized apple, 3/4 tame apple, 1/4 wild crab. Pedigree: Mercer crab x Tolman Sweet apple pollen. In 1939 the fruit was 2.5 inches across; color yellow lightly striped with red; flesh white subacid with spicy sweet fragrance. Cooks up quickly into excellent light yellow sauce; the slices retain their shape in cooking. Season winter. Scions only, per foot, 50 cents.

American Wild Crabapple Hybrids

The following trees are all one-year-old root-grafts on Siberian crabapple (Alexis) roots. Price: one-year-old root-grafts of any variety in the following list, each $1.00. The root-grafts are available in the following numbers:

Watapa	82	Wiyuta	50
Wamdesa	17	Wotanda	75

Watopa Crabapple - Introduced 1939. Pedigree: Elk River, Minnesota, wild crab x Jonathan apple pollen. A sister to Wamdesa introduced in 1938, but larger, the fruits in 1938 being 2 7/8 inches across. Fruit regular, round, truncated, greenish yellow with much thinly washed and striped red over green and much green out over base (stem end); skin unctuous; basin, smooth, abrupt, calyx segmonts very small, closed. An all-the-year keeper. Tree very productive. Flavor mildly acid to neutral in the cooked fruit.

Wamdesa Crabapple - Introduced 1938. Pedigree: Elk River, Minnesota wild crab x Jonathan apple pollen. Fruit 2 inches in diameter, thin solid red all over; dots large, russet, many areolar; unctuous; basin deep, smooth, abrupt. Flesh juicy acid, acerb, cooks up tender into pleasant light colored, mildly acid and acerb sauce. An all-year keeper. A very heavy bearer.

Wiyuta Crabapple - Introduced 1939. Pedigree: Nevis, Minnesota wild crab (Pyrus Ioensis) x Wolf River apple pollen. This is of the same pedigree as Wetonka, Wahoya and Wakaga described in previous lists. Fruit 2½ inches across; 2 inches deep, round, slightly truncated, regular; much shaped and marbled red over greenish yellow, cavity (stem end) with much green out over base. A great improvement, when cooked, over the Nevis wild crab. Season evidently all winter and spring. Fruits of Wetonka after freezing solid until late in January this year, when cooked had lost the acerbity and were of neutral quality.

Wotanda Crabapple - Introduced 1939. The largest of several seedlings of the same pedigree: Nevis, northwest Minnesota, wild crab x Northwestern Greening apple pollen. Fruit 2½ x 2 inches. Very regular, oblate, unctous, yellowish green. Calyx segments very small, closed. Fruit an all-the-year keeper; heavy for its size, one fruit weighed a little over four ounces. When cooked, the flavor is mild. Tree productive.

SEMLA apple - Offered for the first time. The next largest apple in 1939. Pedigree: an open-pollinated seedling of Wolf River apple. Fruit very large, 3 inches in diameter, oblate with red stripes with mixed and solid red over yellow ground, with grayish net-veining. Basin smooth, abrupt, narrow; cavity acute, narrow, russeted. Flesh pleasant subacid. When propagated and under orchard conditions probably the fruit will be larger than three inches. Excellent quality sauce. (Semla: the Russian for "family"). Scions only, per foot, 50 cents.

LINA apple - Introduced 1933. A seedling of Malinda. If a late yellow apple is desired, the Lina, a seedling of Malinda, should be tested. Fruit 2½ inches across, somewhat conical, truncated, good juicy subacid. It is shaped much like Malinda, but no corrugations in basin or blossom end. A good crop in 1939. Scions only, per foot, 50 cents.

International Apples

Of the large number of 3-species or triple hybrid seedling apples combining the apple of Europe, Asia, and North America, only a few can be mentioned. They were given the group name TRIO and introduced 1938.

Kit Trio Crabapple - Introduced 1938. Pedigree: Mercer x Sweet Russet crab pollen. Fruit 1 5/8 inches across, a rich polished yellow all over; flesh pleasant, sweet, juicy, and cooks yellow and tender; the slices retain their shape, quality good. A heavy crop in 1939. Scions only, per foot, 50 cents.

S. D. Waldo Crabapple - Introduced 1938. Pedigree: Fluke No. 10 x Duchess apple pollen. This is 87.5% Malus apple, 12.5% Ioensis wild crab. Fruit 1 3/4 inches across, oblate, angular, truncated, color a rich striped mixed red all over. The flesh is a rich aromatic sweet subacid. An excellent eating crab. In cooking, the sauce tinted light red and the slices retain their shape. The tree is an enormous bearer. Scions only, per foot, 50 cents.

Twelve Hardy Apricots

These apricots were grown from native seed that Dr. Hansen gathered in the Harbin region of North China, a region with -50° Fahrenheit winter cold. These 12 Manchurian apricots were widely distributed, literally from coast to coast, and are in extensive propagation by many nurserymen. There is a vast market open to good hardy apricots. There are only 18 trees available of the Tola, which are reserved to make up complete sets. Of the other 11 varieties, one year trees, buds or grafts on native plum stock, are available at one dollar each. Order as early as possible to get the varieties you want, or leave the choice to us.

For the convenience of the reader, the following descriptions of these apricots is reprinted from S. D. Bulletin 309 which is sent free to applicants. These original trees again bore a heavy crop in 1938, and a lighter crop in 1939 on trees crowded in nursery row and cut for bud-sticks and scions.

Twelve Named Varieties of the Manchu Apricots

Manchu - Large yellow fruit; heavy crop. Fresh fruit No. 1 in size and quality. Cooking test: cooks up into pale yellow good quality sauce. Apparently the largest fruit in this lot of seedlings. The name Manchu apricot is now reserved for it.

Mandarin - Fruit large, rich yellow color; one of the best in quality, fresh or when cooked.

Chow - Tree productive; fruit large, good eating. Cooking test: pale yellow sauce of good quality.

Sing - (Chinese for apricot.) Tree productive, fruit large. Cooking test: good rich orange yellow sauce, flavor stronger than some of the others.

Ninguta - Fruit large yellow with red blush. Crop very heavy. Season late, first week in August. Fresh fruit very mild, one of the mildest and best.

Tola - Large, freestone. Makes excellent quality sauce. 1935 crop very heavy. One of the best. Season early. August 1935.

Anda - Tree productive, freestone of good size. Season late. In cooking, stays firm and does not cook up. One of the very best in quality.

Zun - Quality of fruit, nearly excellent. Pit small, round freestone.

Sino - Heavy crop, fruit small, on 8 foot crowded tree. Cooking test: excellent flavor.

Lalin - Fruit large, yellow with red blush. Fresh fruit good quality. Tree, a heavy crop. No cooking test. Season early.

Hulan - Very heavy crop of large fruit. Season early. Cooking test: makes good flavored sauce.

Sansin - Heavy crop of large fruit. Fresh fruit of excellent quality, making a rich orange-yellow sauce.

Perfumed Plums

In originating the first hybrids of our native plum (Prunus Americana) with the Chinese apricot-plum/Prunus Simoni, there were 16 seedlings. Of these, Kaga, Hanska, Toka, and Inkpa were named and distributed. Tokata, the reciprocal hybrid, was also sent out and by many is regarded as the finest of all in its superb flavor. Kaga, Toka, and Hanska are now widely grown in many states for the excellent flavor. Also, an excellent pollenizer for other plums.

There is another of these 16 original seedlings worthy of introduction because of its larger size, and it is now named the Kota. The tree is very productive. It make a splendid record in the State Orchard at Sioux Falls in 1938 and 1939.

The Kota plum was introduced 1939. A sister to Kaga, Toka, and Hanska, but the fruit averages larger. Fruit 1 3/4 inches across, 1½ inches deep, a vivid dark red with large distinct yellow dots and white bloom; oblate, with slightly sunken apex; suture very wide and shallow; cavity deep, regular, acute; stem stout. Flesh very firm, richly fragrant and delicious. In general, the multitude of large yellow dots is a distinguishing characteristic. Price of the 58 Kota one-year trees grafted on native plum, each $1.00.

Oacoma - A Delicious New Native Plum

First introduced spring 1938. A ten-year test in the State Orchard at Watertown, on a hill, without protection, demonstrated very clearly that native South Dakota plums were much hardier than native plums from further South. Fruit red, round, 1 3/8 inches across, of very best quality eaten fresh or as preserves. Skin thin, dissolves in cooking. The pit is rather small, round, flattened with smooth rounded edges and no sharp points. The high quality of this pure native South Dakota plum should quickly make it a general favorite. The tree is perfectly hardy and a heavy bearer. The original tree of Oacoma was found a few miles west of Oacoma in Lyman County and was first sent out as South Dakota No. 12 in 1934. This is now named Oacoma. No matter how many hybrid plums are introduced, some of the northern pure native plums should be in every orchard to provide abundant pollination. Many people like the stronger flavor of the native plum, especially for preserves and jam.

One year grafts on native plum, made in the field, 49 trees, each $1.00.

Ural Mountain Cherry

First introduced in 1938. In the Ural Mountain region of West Siberia, a dwarf red cherry in being collected in a large way under government auspices. Selection is under way at the Experiment Station at Cheliabinsk as noted in the 1934 tour to Siberia; one was brought in nearly as large as the Early Richmond Cherry. As fruited at Brookings in 1938 and 1939 the fruit is a red sour cherry of good quality, but smaller than the standard sour cherries. This is a cherry for the far North where standard sour cherries are not hardy. The plant sprouts freely. The botanical name is Prunus fruticosa, Pall. In 1939 the fruit of the Ural Mountain Cherry was a bright red with clear acid flesh much like a small Early Richmond. The price of root sprouts, each $1.00.

The Hansen Bushcherry: Two new seedlings; nearly one inch across

The work in improving the South Dakota native sandcherry, Prunus Besseyi, began in 1895 and now is well along in the second million seedlings covering 14 generations. This selected strain is now called the Hansen Bushcherry. In 1938 and 1939 about one thousand plants out of 35 acres of seedlings were marked for further propagation.

In selection the weight of 100 ripe cherries is determined, then the fruit is pitted and the ratio is determined between the weight of 100 pits and 100 ripe fruits. The size of the pits is decreasing each generation, in some the size is less than one-fourth of the original size. The usual color of the fruit is black but many good yellow-fruited seedlings have appeared. In 1938 the first breaks into red fruit were noted. All these are now in propagation.

These selected plants are budded on native plum. It is the plan to breed these true to seed as rapidly as possible.

Checkpa and Kasota, two of the 1939 seedlings, were outstanding; the size of the fruit was nearly one inch across. The exact size was 15/16 inch, but when budded and given and given more room, the size very likely will be fully one inch. They are both pure Prunus Besseyi, of excellent quality and very productive. The cooked sauce was considered equal to California cherries by good judges, although they are not the same.

Many one-inch sandcherries have appeared before, but not introduced as they were evidently chance hybrids not up to Sapa or Opata.

Every farm in the state should contain at least a hundred of these Hansen Bushcherry plants to serve as a good source of fruit. Home-makers living near the State Orchard at Watertown save the flesh, using hand cherry-pitters, and can annually from 1,000 to 1,500 quarts. This shows these cherries are good for sauce and preserves.

The question is asked: "What may be expected of a good bushcherry budded on native plum?" The crop at Watertown the past season was 12½ pounds of fruit on some plants, and they were rather crowded in the rows at that. Plants of Hansen Bushcherry: one-year seedlings of the latest selection, 3 for $1.00

Checkpa bushcherry - Offered for the first time. The largest and best so far. The fruit in 1939 was black, almost one inch in diameter, exact size 15/16 inch. The weight of 100 fruits was 418 grams and the percentage ration of pit to fruit 3.92. In other words, out of 100 pounds of fruit, only 3.92 pounds would be pit. The highest quality for this species; the sauce is excellent. This variety is named in honor of Chief Checkpa, a great Sisseton Indian chief who died in 1926 at his home at Pickerel Lake, north of Webster. He was said by all to have been the "ideal type of Indian in bravery, physique, stature and ideals."

Kasota bushcherry - Offered for the first time. The second best bushcherry of 1939. The color black. Size 15/16 inch in diameter, or nearly one inch. The weight of 100 fruits is 406 grams and the percentage ratio of pit to fruit is 5.29. The quality is very good. (Kasota is the Sioux Indian name for "a clear sky").

Plants of Checkpa and Kasota are now in dormant bud on native plum root for distribution for fall 1940 as one-year-budded plants. For spring 1940, a few scions at $1.00 per foot.

Good Grapes Hardy Without Winter Protection

From S. D. Bulletin No. 309: "There is a great need for grapes of choice quality that will be hardy without winter protection in South Dakota. Concord and all its descendants will not help us, as they are too short-lived. The Beta and Alpha, which are large fruited selections of the wild grape of Minnesota, are hardy without winter protection, but we need something larger in size and better in quality. In the spring of 1925 I introduced 32 of my new grapes, mostly hybrids of the wild grape collected at Bismarck, North Dakota, and Fort Pierre, South Dakota, with choice eastern grapes, especially with Roger hybrids. The series of dry seasons has delayed the propagation of these new grapes, and the demand for cuttings has taken most of the crop each year.

"My opinion is that these new grapes and their successors along the same line of breeding will eventually revolutionize the grape culture of the prairie Northwest. Our prairie farmers will not lay down and give winter protection to any grape vine. But these new grapes are not intended to go into the milder regions where the Concord and its seedlings are hardy without winter protection. The problem now is to find the best few out of the 32 varieties. Also, there is a problem of whether the market prefers black grapes, white, or red grapes. Some of the choicest quality grapes are not the largest in size."--N. E. Hansen

The following 18 varieties are available:

Atkan	Eona	Siposka
Arikara	Lachala	Sonona
Azita	Mandan	Toscha
Chonkee	Napka	Wachepa
Chontay	Ree	Wecota
Emana	Shakoka	Wetonka

For description, see S. D. Bulletin No. 224.

Price of these grapes, assorted cuttings, customers' choice as far as supply permits; otherwise, our selection: 10 for $1.00.

Good Hybrid Gooseberries

Eleven varieties of gooseberries with large fruit of good quality are described in Bulletin 224. They are hybrids of the giant gooseberry of western Europe with the wild gooseberries.(Ribes gracile) from Lake Oakwood and Gary, South Dakota. The western European gooseberries are the largest in the world, but all winter-kill in the prairie Northwest. This hybridizing was done in the fruit-breeding greenhouse of this Station. The European gooseberries did not live long even with special care, but long enough to make the cross. In 1924 the Sunset gooseberry was offered. Ten other varieties were introduced in 1925. Good plants grown from layers are available at 50 cents each in the following numbers:

Kabu---------- 6	Kapoza----------34	Keza----------13
Kaduza---------13	Kataga----------29	Kopa----------35
Kana----------25	Kawanka--------- 8	Sunset----------24
Kanega---------15	Kazonta---------41	

These gooseberries are marked by heavy bearing, large size, and good quality.

Progress With Hardy Roses

The State Rose Garden is located at Sioux Falls. There and at Brookings some 20 acres are devoted to originating roses that will be hardy without winter protection, also, to originating hardy thornless rose stocks. The Rose Annual of the American Rose Society with several thousand members in America and many foreign lands, published the fact that South Dakota is the first state in the union to have a State Rose Garden.

The progress in Hardy Roses at this station was recognized June 29, 1938, at the annual meeting of the American Rose Society at Des Moines, Iowa, in awarding First Prize to N. E. Hansen for 41 new seedlings. The leading rose in this collection has been named Lillian Gibson.

Much hybridized rose seed was harvested from the breeding experiments in 1938 and 1939. The rose-breeding experiments are carried on with a Federal appropriation; the land is furnished by the state. The nurserymen of America with 25 million roses to bud annually would like hardy smooth-wooded stocks. To originate such stocks is also a part of the work.

Yawa Rose - Offered for the first time. A sister to the Pax Iola rose. Pedigree: Anci Böhm (a red multiflora from Czecho-Slovakia) x Bemidji, Minnesota, Rosa blanda pollen. (Yawa: the Sioux Indian word for "esteem"). This is not a Pax rose as the main stem is thorny, especially near the base. But all the side shoots are smooth or nearly so. A tall, wide-spreading open-habit pillar rose with 9-foot stems; a very free bloomer in June and early July. Color a delightful light coral pink, quite double, 58 petals, flowers fragrant, two inches across, in clusters from 4 to 12, on the side shoots with 8 to 12 inch stems. A good rose for corsages for small bouquets. Apparently no seed hips are formed, indicating that in such combinations the Pax or thornless character must be obtained in the first cross. Perhaps the pollen will be useful. Only scions available. Per foot, $1.00.

Lillian Gibson Rose- Introduced 1938. Pedigree: Wild rose (Rosa blanda) from Wilton, northern Minnesota x Red Star (a red Hybrid Tea) pollen. This rose turns out to be very productive; a strong sprout planted last year bore 31 flowers this year. This rose was the sensation at the Sioux Falls Show, June, 1937. The flowers are large, double, over 40 petals, a beautiful lively rose pink, about three inches across with delightful rich fragrance. A very abundant bloomer in late June. Plant of strong upright sturdy growth. The plant is sparsely thorny on young shoots, with scattered thorns on the old shoots. Available stock: 5 own-root sprouts; 9 one-year root-grafts on Rosa blanda (Bonanza Springs, Minnesota) stock: each $1.00.

Progress in Hardy Double Thornless Roses

These experiments with many thousands of rose seedlings show it to be fairly easy to get the thorns off of the wood, but very difficult to get the bristles from the rachis or midrib of the leaf. Evidently these are two quite different problems.

The three Pax Roses are only a beginning. Pax is the Latin for peace. Thorns are not necessary in Roses. These Pax Roses are nearly thronless. Eventually Pax may be declared in the Rose gardens of the world!

100% Thornless Roses

In clearing twnety acres of rose seedlings in 1932 in the State Rose Garden at Sioux Falls and at State College, a few 100 per cent thornless rose plants were selected for further work. Both leaves and wood are smooth. These were introduced in 1936. The flowers are single, pink, fragrant. The abundant red rose-hips in autumn and winter are noteworthy. These plants are of sturdy upright habit and are now being crossed with many large double-flowered varieties in other colors. In their present condition they are pleasing ornamental shrubs that will endur 50 below zero Fahrenheit without protection, and which may be found useful by the rose-breeders in eliminating thorns.

In 1937 out of 11,053 seedlings of these 100% thornless roses, 613 seedlings or about 5½%, were entirely smooth even the first year from seed. The hope is to make this character come true to seed and that it will be a dominant homozygote in hybridization with standard double roses.

Strong plants of the 100% thornless roses noted in S. D. Bulletin 309, each 50 cents.

Pax Amanda Rose - Introduced 1938. Pedigree: Frau Georg Von Simson (a multiflora climber from Europe) x pollen of Rosa blanda, wild rose from Wilton, Minnesota. A gorgeous bloomer, light pink turning to white, semi-double in clusters. Petals about 17. A strong upright grower, with dark brown 7-foot stems. The stems are smooth except a very few thorns near the ground; the midrib of the leaf is bristly. Available: 2 one-year plants on Rosa blanda (Bonanza Springs, Minnesota) stock: each $1.00.

Pax Apollo Rose - Introduced 1938. Pedigree: Rosa sempervirens pallida x pollen of Rosa blanda wild rose from southern Manitoba. A wonderful producer of deep pink flowers in large clusters in June. Petals about 14. Tall, upright, 7-foot dark red stems. The wood is smooth; on strong shoots the midrib of the leaf is bristly. Available: 2 one-year plants on Rosa blanda (Bonanza Springs, Minnesota) stock: each $1.00.

Pax Iola Rose - Introduced 1938. Pedigree: Anci Böhm (a climbing rose from Europe) x pollen of Rosa blanda, wild rose from Bemidji, north Minnesota. Flowers a semi-double clear shell pink. A strong grower, evidently of the pillar type. The shoots close to the ground also full of bloom. Hundreds of flowers 2½ inches across in large clusters. Petals about 25. The older flowers are nearly white; these two colors make the bush a thing of beauty. The stems of strong growth are all smooth; the rachis or midrib of the leaf is bristly, but a pleasing thornless bouquet can be cut from the side shoots. Available: 11 root-grafts on Rosa blanda (Bonanza Springs, Minnesota) stock and 4 plants budded on Rosa multiflora, each $1.00.

Hardy Roses Already Introduced

Alika: A Hardy Red Rose - First offered spring, 1930. Color brilliant red with no purple, mauve or violet red in it. It gets far away from the mauve pink of most of our wild prairie roses. Propagates rapidly from sprouts. Dr. Hansen brought this hardy, beautiful, double, fragrant, brilliant red rose from Russia in 1906, under the name Rosa gallica grandiflora. The Alika roses made a gorgeous display in the State Rose Garden at Sioux Falls the past season. Alika roses on own roots, each $1.00. Sprouts from these plants will be true to name.

Mrs. Mina Lindell Rose - Introduced 1927. A beautiful, semi-double light pink wild rose found in Butte County, South Dakota. Plants on own roots, each 50 cents.

Pink Semi Rose - A pink single flower selection of the Semi rose from Semipalatinsk, Siberia (Rosa laxa, Retz). It was a pleasure to note at the Federal Horticulture Station at Cheyenne, Wyoming, in 1937, that the Pink Semi rose is very resistant to alkali. This variety should be good for hedges on such soil. Own-rooted plants, each 50 cents.

Okaga Rose - Introduced 1927. Pedigree: Rosa gallica grandiflora x Tetonkaha. A very fine semi-double rose. Flowers, deep pink; low bush; blooming very freely in June and first half of July. Available stock, 15 own-root sprouts, each $1.00.

Kitana Rose - Introduced 1927. Pedigree: Tetonkaha x Rose Apples, a Rugosa hybrid from England. A vigorous, hardy, semi-double pink rose, blooming very freely in June and into July. Flowers, 3 inches in diameter; intense fragrance; petals, about 36; petaloids, 25. Red fruit sets freely. Flowers are somewhat globular with little pollen; deep lavender pink. Available stock, 4 plants budded on Rosa rubrifolia, each $1.00.

Koza Rose - Introduced 1927. Pedigree: Seed parent, our seedling of Rosa rugosa, Siberian form x La France; pollen parent, La Melusine, a rugosa hybrid. Vigorous plant, over 7 feet in height; a profuse bloomer. Flowers semi-double; deep pink; blooms freely through July and into August. Available stock, 3 own-root sprouts, each $1.00.

Zani Rose - Introduced 1927. Pedigree: Seed parent, Rosa rugosa, Siberian form x Anna de Diesbach; pollen parent, Tetonkaha. Of this pedigree we have a number of hardy, strong growing seedlings, six to eight feet in height, blooming very freely from June until the middle of July. Flowers, semi-double; color, a fine dark crimson with a white streak through the center petals. This is very marked characteristic. Available stock, 24 own-root sprouts, each $1.00.

Zika Rose - Introduced 1927. Pedigree: Seed parent, Rosa rugosa, Siberian form x Anna de Diesbach; pollen parent, Tetonkaha. Flowers, semi-double; color, fine shell pink; fragrant. Available stock, 65 own-root sprouts, each $1.00.

Yatkan Rose - Introduced 1927. Pedigree: Somewhat uncertain but very likely Gruss an Teplitz x La Melusine. Flowers, semi-double, two and one-half inches across; colors, pure pink; blooms through July. Available stock, 50 own-root sprouts, each $1.00.